

USING WILDFIRE MODELS FROM ISU'S GIS TREC

This document describes the general process you can use to successfully develop a wildfire susceptibility, wildfire hazard, and/or wildfire risk model for your area of interest (AOI). First, understand that each of these types of models (susceptibility, hazard, and risk) build upon one another with the base or core model being the wildfire susceptibility model. You must first create a susceptibility model before trying to create a hazard model. The resulting hazard model is then used to create a risk model.

Second, understand the difference between each model and use the correct terminology¹ to communicate the results of your work.

Before jumping into the development of wildfire models for *your* AOI, spend some time getting to know the models we have developed. Each model contains an ArcGIS Pro Toolbox file (*.atbx) and two folders. For the Hazard model, one folder is the HazardModelInputs folder and the other is the HazardModelOutput folder. The model inputs folder contains the data layers necessary to re-create the wildfire hazard model for Bannock County, Idaho. Remember, you will also need the output from the wildfire susceptibility model as an input. This is not stored in the HazardModelInputs folder but is found in the ModelOutput folder (you can also download the wildfire susceptibility model from the ISU GIS TREC spatial library²). You will need similar input layers to create wildfire models for your AOI.

Let's take some time to get acquainted with the wildfire hazard model:

1. For simplicity, I suggest creating a new ArcGIS Pro project for your wildfire modeling efforts. Alternatively, you could integrate these models into an existing project.
 - a. Copy the entire contents of our wildfire model into the project folder of your ArcGIS Pro project. This includes the model input folder and its data, the model output folder (which is currently empty), along with the model's toolbox file (*.atbx)
 - b. From ArcGIS Pro, use the Catalog pane to verify these files exist. Your project folder should look similar to the figure below.

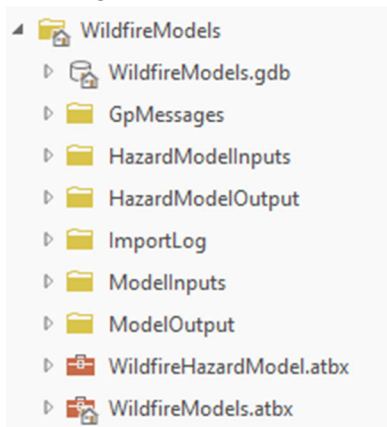
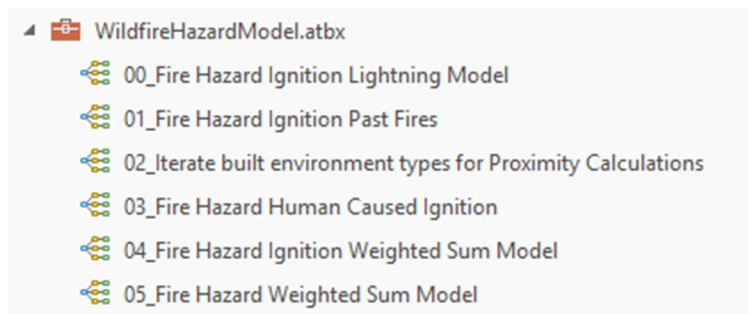


Figure 1. An ArcGIS Pro project was created and named WildfireModels. After copying the wildfire hazard model data into the project folder (WildfireModels), the project will contain two new sub-folders and a new toolbox.

¹ Cf. https://giscenter.isu.edu/pdf/PDF_NASA_SPARC/WildFireTerminologyReview.pdf

² Cf. https://giscenter-sl.isu.edu/AOC/AOC_Research/SPARC/

2. From the Catalog pane, expand the hazard model inputs folder.
 - a. Notice it contains two **EXAMPLE** shapefiles, one geodatabase, and two raster layers (these can be used to create a wildfire hazard model anywhere in Idaho).
 - b. Expand the Hazards geodatabase.
 - c. You will see three vector feature classes. Each is an **EXAMPLE** layer you can use to replicate the wildfire hazard model for Bannock County, Idaho. You can also use these layers as templates for the creation of similar layers for your AOI.
 - d. The shapefile and geodatabase feature classes are essentially identical and you can choose to use either file format in your modeling work.
3. Add each of the example layers to the current map in ArcGIS Pro. Explore these layers to familiarize yourself with these data, their spatial resolution, spatial reference system, range in numeric values, and attributes.
4. Next, return to the Catalog pane and expand the model toolbox. It should look like the figure below.



5. Before running any of the models, take a few minutes to become acquainted with the model and its overall workflow. To do this, iteratively open each model by right-clicking the model and selecting **Edit** from the fly-out menu.

Do not make any changes to the model, just review it so you are familiar with how each model functions. When finished, close each model.

6. It is important to run the toolbox models in the order indicated by the model's name. In other words, run model 00 first, then model 01, etc. This is important as some models use output from a previous model.
7. When the final model builder tool completes, you will have a wildfire hazard model for Bannock County, Idaho.
8. You can now, prepare data for your AOI and re-run each of the model tools to develop a wildfire model for your AOI.
9. If you encounter errors while running any of the models, please let us know by emailing giscenter@isu.edu

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